



Thermo-chronological constraints on Albian post-rift exhumation from the northern Pyrenean foreland basin

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After a period of subsidence and syn-rift extension during the Aptian-Early Albian, the Late Albian-Cenomanian period in the southern Pyrenees was characterized by the deposition of fluvial sandstones. Source rocks of these sandstones have been thought to be located northwards as a consequence of erosion and possibly uplift of the continental margin during the post-rift phase. In order to test this hypothesis and to quantify exhumation, combined AFT and U-Th(He) thermochronometry were conducted in the Tertiary sediments to reconstruct past-exhumation. In addition, combined U/Pb and U-Th(He) dating on zircon have been carried within the Albian deposits of the southern Pyrenees to understand the dynamics of exhumation and types of source rocks.

Preliminary results obtained with AFT dating show one grain population with consistent Albian ages of ~ 100 Ma. These cooling ages are interpreted as related to the Albian post-rift exhumation. New U/Pb ages in Tertiary deposits have raised questions on the source of zircon grains with Permian and Triassic to lower Jurassic ages. The same question a fortiori holds for the source of the Albian series. Results of this thermo-chronometric study can help to unravel the mechanism of the Aptian-Early Albian extension. As an example, this study adds new data to the discussion on the exhumation of the subcontinental mantle along a low-angle extensional detachment during the Albian-Cenomanian times as proposed in recent publications.